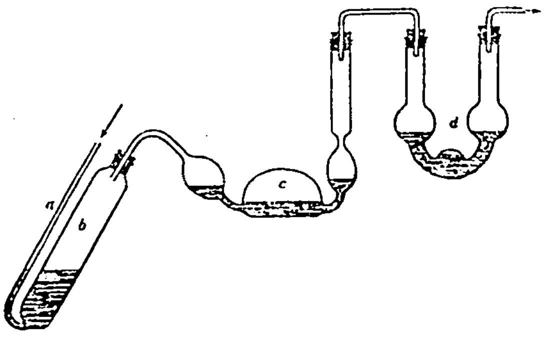
method. No bromine is carried over if the solution be neutral. The residue in *b* is cooled, a slight excess of permanganate of potassium added, and the vessel again warmed in a water-bath to 50° to 60° C. The bromine vapour which is then evolved is drawn into and absorbed by dilute ammonia placed in *c* and *d*, and then either volumetrically or gravimetrically determined as silver bromide. In the final residue in *b* the chlorine may either be directly determined or calculated from a determination of the total halogens.—T. L. B.



Iron Analysis. O. Gmelin. Chem. Zeit. 1885, 925.

Sulphur Estimation.—The sulphur is determined, after evolving it as sulphuretted hydrogen, and passing this through two U-tubes furnished with bulbs, which contain permanganate solution. Some concentrated solution of sodium carbonate is introduced into the decomposing flask before the hydrochloric acid is added, so that the carbonic acid evolved may expel air.

Phosphorus Estimation.—The sulphuric acid solution freed from silica, is evaporated in a platinum dish, and the residue is gently ignited. After dissolving in hydrochloric acid, the phosphorus in the form of phosphoric acid is precipitated with ammonium molybdate solution, a final precipitation with magnesia mixture being made.
—J. T.

The Volumetric Determination of Manganese in Alloys, Minerals, etc., by means of Potassium Chlorate. W. Hampe. Chem. Zeit. 9, 1083.

The method has been already described by the author two years ago, and the present paper describes the results of subsequent work, considerable space being given to discussion of the observations of other experimenters. A historical notice includes the names of Rammelsberg, Wächter, Hannay, E. Thomson, Ford, Kent, Troilius, Williams and Raymond. The process consists of the precipitation of manganese as hydrated peroxide from its solution in strong nitric acid, by the addition of potassium chlorate at a boiling temperature, and the titration of the peroxide by iron salt and permanganate. The solution must not contain sulphuric or hydrochloric acids, and where these occur their removal is effected by means of barium nitrate, or by boiling with nitric acid respectively. It is essential that the solution of the metals be in nitric acid, of sp. gr. 1·4, and if the acid be weaker than this it must be boiled down until heavy white fumes are evolved, when the necessary concentration is reached. A large excess of acid is without hindrance to the reaction. In the presence of acid of less sp. gr. than 1·4, a portion of the manganese escapes precipitation by forming permanganic acid. To describe the process shortly, the solution in strong nitric acid is heated to boiling in a flask, and potassium chlorate is dropped in, a crystal at a time, as long as green vapours are evolved; when the manganese has become completely precipitated, further addition of the chlorate produces only scarcely-perceptibly coloured vapours. Five minutes' boiling is necessary to complete the precipitation. Cold water is then added to the still warm solution, and this is then quickly filtered through a paper filter, and the precipitate is washed. The precipitate is then washed off the filter into a flask, acidified iron salt solution is added, which dissolves the precipitate, and the excess of iron salt is determined by titration with permanganate. The manganese peroxide obtained by this method has constantly the composition MnO_2, on which the standard solutions used are based. The observations of Ledebur, Kent, Mackintosh, Volhard, Pattinson and Wolff, on the reaction, are noticed. In the presence of cobalt lead and bismuth, the precipitate should be dissolved in nitric acid, and a little oxalic acid, and reprecipitated as before, in order to obtain exact results. Potassium bromate does not work so well as the chlorate. Where the percentage of manganese is small, as much as 20grms. or more of substance may be used without inconvenience. A series of results obtained in presence of other metals is given to show the exactitude attainable. The treatment most convenient in special cases, as for certain alloys and minerals, is described at length. The author considers this method to equal in exactness and universal application the phosphoric molybdic reaction.—G. H. B.

New Books.

Handbook of Technical Gas Analysis, containing Concise Instructions for carrying out Gas-Analytical Methods of proved utility. By Clemens Winkler, Ph.D., Professor of Chemistry at the Freiberg Mining Academy. Translated with a few additions by George Lunge, Ph.D., Professor of Technical Chemistry at the Federal Polytechnic School, Zurich. London: John Van Voorst, 1, Paternoster Row, 1885.

Large 8vo volume, bound in cloth, containing Translator's and Author's Prefaces, Table of Contents, Introduction, subject matter covering 122 pages, and an Alphabetical Index. The work is illustrated with 55 well-executed woodcuts. The subject matter is subdivided as follows:—Chapter I. On taking Samples of Gases. II. On the Measurement of Gases. III. Apparatus and Methods for carrying out the Analysis of Gases. (i.) Estimation of Gases by Absorption. (ii.) Estimation of Gases by Combustion. (iii.) Gas Analysis and Gas-volumetrical Analysis by means of Lunge's Nitrometer. An Appendix which completes the work, contains a series of useful Tables for Reference and Employment in the Calculations involved in the Analytical Operations.

The Art of Soap-making. A Practical Handbook of the Manufacture of Hard and Soft Soaps, Toilet Soaps, etc. Including many New Processes, and a Chapter on the Recovery of Glycerine from Waste Leys. By Alexander Watt. [Second Edition, carefully revised.] London: Crosby, Lockwood & Co., 7, Stationers' Hall Court, Ludgate Hill, 1885.

Octavo volume, bound in cloth, containing Preface, Table of Contents, and 228 pages of subject matter, followed by an Alphabetical Index. The work is illustrated by 36 woodcuts, and the Chapters are divided as follows:—Chap. I. Saponification Explained. II. The Soap Factory—its Apparatus and Appliances. III. Materials used in Soap-making. IV. Caustic Leys. V., VI. and VII. Manufacture of Hard Soaps. VIII. Making Soap by the Cold Process. IX. Oleic Acid—Soap from Recovered Grease. X. and XI. Cheapened Soaps. XII. Disinfecting Soap. XIII. Saponification under Pressure. XIV. Various Processes. XV. and XVI. Manufacture of Soft Soaps. XVII. Manufacture of Toilet or Fancy

Soaps. XVIII. and XIX. Manufacture of Toilet Soaps. XX. Soft Toilet Soaps. XXI. Medicated Soaps. XXII. Miscellaneous Soaps. XXIII. Miscellaneous Processes. XXIV. Alkalimetry—Methods of Determining the Percentage of real Alkali in Potash, in Commercial Soda-ash, Potash, and Caustic Alkali. XXV. Methods of Analysing or Assaying Soaps. XXVI. Purifying and Bleaching Oils and Fats. XXVII. Recovery of the Glycerine from Waste or Spent Leys. XXVIII. Useful Notes and Tables.

A TEXT-BOOK OF TANNING: A TREATISE ON THE CONVERSION OF SKINS INTO LEATHER, BOTH PRACTICAL AND THEORETICAL. By HENRY R. PROCTER, F.C.S., of Lowlights Tannery, Examiner in Tanning to the City and Guilds of London Institute. London: E. & F. N. Spon, 125, Strand. New York: 35, Murray Street. 1885.

THIS 8vo volume, well bound in cloth, contains 274 pages of subject matter and an alphabetical index. It is illustrated by eight photographic plates, and with 67 well-executed wood-cuts.

Though the name of Mr. Procter, as the author of the work, is a guarantee for the practical value of the information given, yet a summarised list of the subdivision of the text into chapters will indicate the mode of treatment followed, and the compass of that treatment.

Chapter I. Anatomical Structure of Hide. II. Chemical Composition of Hide. III. Commercial Tanning Materials. IV. The Chemistry of Tannins. V. Water as used in Tanning. VI. Methods of Chemical Analysis for the Tannery. VII. to XI. Sole-leather—Preparing the Hides—Unhairing Hides—Tanning Materials—Treatment in the Tan-house—Treatment in the Shed. XII. Dressing Leather. XIII. Currying. XIV. Enamelled, Patent, or Japanned Leather. XV. Morocco Leather. XVI. Russia Leather. XVII. Chamois or Wash-leather. XVIII. Crown Leather, or Preller's Leather. XIX. Mineral-tanned Leather. XX. Calf-kid. XXI. Glove-kid. XXII. Construction and Maintenance of Tanneries. XXIV. Commerce, Statistics, and Bibliography.

Chapter XXIV. is very carefully compiled by Mr. C. G. Warnford Lock, as well as Chapter III. From the list of works of reference we miss, however, the name of the *Journal of the Society of Chemical Industry*, with its special Chapter XIII. devoted to Tanning, Leather, etc., and the valuable paper of Mr. W. J. A. Donald, on the Chromate Process of Tanning, *J. Soc. Chem. Ind.* vol. iii. p. 615.

Monthly Patent List.

ENGLISH APPLICATIONS.

1885.

I.—GENERAL PLANT, APPARATUS, AND MACHINERY.

12481 A. Brin, London. An improved refractory substance or material suitable for lining furnaces, or for other purposes where a material capable of withstanding a high temperature is required. October 19

12892 J. C. Mewburn, London—Communicated by C. C. Peck, France. Improvements in distilling and concentrating liquids, and apparatus therefor. October 27

12997 A. Stewart and C. Stewart, Glasgow. Improvements in the fittings and application of injectors for burning liquid fuel in furnaces for generating steam, smelting and melting metals, consuming smoke, and similar purposes. October 29

13089 T. B. Lightfoot, London. Improvements in machinery or apparatus for refrigerating or producing ice. October 30

13250 W. Jarvis, Banbury. Pumps for liquids or fluids. November 3

13272 J. W. Holden, London. Improvements in apparatus for economising fuel and consuming smoke in, and otherwise increasing the steam generating properties of boilers, partly applicable to ventilating purposes. November 3

13466 E. Solvay, Liverpool. New or improved apparatus for, and process for producing, applying, and keeping up extreme temperatures. Complete specification. November 6

13583 B. H. Remmers and J. Williamson, Glasgow. Improvements in tubular heating and cooling or condensing apparatus. November 9

13779 F. B. Welch, Manchester. Apparatus for grinding or reducing solid materials, and for mixing fluids or semi-fluids therewith. November 12

13799 L. H. Pearce, London. Improvements in distilling liquids and in apparatus therefor. November 12

13859 J. G. Robinson, Halifax. An improved construction of regenerative or recuperative furnace, applicable to gas, iron, steel, glass or other furnace. November 13

II.—FUEL, GAS, AND LIGHT.

12510 H. M. Morrison, London—Communicated by J. G. Hathaway, United States. Improvements in apparatus for pulverising fuel and feeding it to furnaces or fires for combustion therein. October 20

12599 F. Vernon Hadlow, Buxted. An improvement in the artificial manufacture of coal, so as to render it comparatively smokeless. October 21

12602 H. Harrison, London. Improved apparatus for regulating the supply of gas. October 21

12638 H. Harris, London. Purification of gas in its passage direct from the meter previously to its entering into the service pipes, thereby improving the illuminating power and economising the consumption and smoke therefrom. October 22

12641 F. J. Jones, London. Improvements in gas producers, and a method for securing the complete combustion of gases in boiler and other furnaces. October 22

12686 S. F. Smith, London. Carrying off the products of combustion from gas and other lights. October 23

12721 J. Lucas Balfour and J. Lane, London. Improvements in the manufacture of illuminating gas and volatile liquid hydrocarbons. October 23

13003 J. Murray, Glasgow. An improved method of creating a current of air in combustion apparatus, and applying the products of combustion to vapour generators. October 29

13010 R. Mitchell and R. B. Main, Glasgow. Improvements in open gas fires. October 29

13064 J. A. Yeadon and R. Middleton, Leeds. Improvements in machinery or apparatus for the manufacture of artificial fuel. October 30

13067 J. A. Yeadon and R. Middleton, Leeds. Improvements in machinery or apparatus for the manufacture of artificial fuel. October 30

13071 W. Armitage, Sheffield. Improvements in apparatus for smoke burning. October 30

13073 J. A. B. Bennett and G. E. Wright, King's Heath. Improvements in apparatus for mixing and burning gases. October 30

13161 S. A. Sadler, London. Improvements in the method of, and apparatus for, absorbing benzol or other hydrocarbon liquids into illuminating gas. October 31

13312 C. A. von Welsbach, London. A novel illuminating substance for incandescent gas burners. Complete specification. November 4

13360 C. Hunt, Westminster. Improvements in ascension pipes used in the manufacture of gas. November 4

13417 G. A. Sweetser, D. W. Bell, and W. Bohn, London. Improvements in the manufacture of candles and apparatus therefor. November 5

13530 T. A. Greene and C. M. Walker, London. Improvements in regenerative gas lamps. November 7

13560 R. Walker, Sunderland. Consuming oil as fuel. November 9

13567 G. Anderson, Spennymoor, Durham. An improved apparatus for the distribution of gas and air in regenerative steel-melting, glass-melting, and other furnaces wherein gaseous fuel is used for heating the same. November 9

13597 T. Rouet, London. The manufacture and employment of grease-proof cases for holding solid albo-carbon in stick, rod, or pellet form, as charge cartridges for easy insertion into albo-carbon lamps. November 9

13621 A. Wright, London. An improved manufacture of medicated candles, night-lights, lamp oils, and the like. November 10

13631 H. J. Allison, London—Communicated by R. P. Ambler and H. Deitz, United States. Improvements in apparatus for making and burning gaseous fuel. Complete specification. November 10

13728 A. Gutensohn, London. An improved fire-lighter, suitable also for use as artificial fuel. November 11

13967 J. Roots, London. Improved method and apparatus for rendering a liquid hydrocarbon gaseous. November 16

13980 D. W. Sugg, London. Improvements in apparatus for lighting by gas. November 16

13981 J. Ashworth, London. Improvements in means for utilising heat, consuming smoke, and economising fuel in furnaces. November 16

13983 J. Shaw and N. Arthur, Glasgow. Improvements in apparatus for feeding fuel to, and promoting draught and combustion in, furnaces. Complete specification. November 16

13990 J. G. Penn, London. Improvements in the manufacture of compound fuel. November 16